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On the lift and drag of cavitating profiles and the maximum lift and drag

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Abstract

In this paper, on the basis of the classical Levi-Civita formulae for hydrodynamic forces exerted on any profile in an infinite cavity flow, we deduce new representations for the lift and drag. In these representations the forces are expressed only in terms of the velocity distribution along the profile surface. So, the representations are analogous to the well-known Kutta-Joukowskii theorem. By means of the new representations we find optimum velocity distributions which provide the maximum lift or maximum drag of cavitating profiles and determine corresponding optimum shapes. © 2011 Cambridge University Press.

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Keywords

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